

DC Office of the State Superintendent of Education

District of Columbia

Comprehensive Assessment System

2009 Released Items
Eighth Grade Mathematics



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

A math quiz, with a maximum score of 100, was given to 12 students. The teacher made the chart below to display the results.

Math Scores

Score (out of 100)	Number of Students
Between 55 and 65	9
More than 90	2
100	1

Assuming that none of the students had the same score, which statistical measure would best represent the scores?

- F** mode
- G** mean
- H** range
- J** median

Content: Mathematics
Item Number: 16
Item ID: 01173252
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.DASP.1
Reporting Category: Data Analysis, Statistics & Probability



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The number of whales Tanisha saw over a 10-week period are shown below.

1, 5, 1, 8, 8, 4, 2, 2, 2, 8

What is the median number of whales she saw over the 10-week period?

- A** 2
- B** 3
- C** 5
- D** 6

Content: Mathematics
Item Number: 27
Item ID: 00881855
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.DASP.1
Reporting Category: Data Analysis, Statistics & Probability



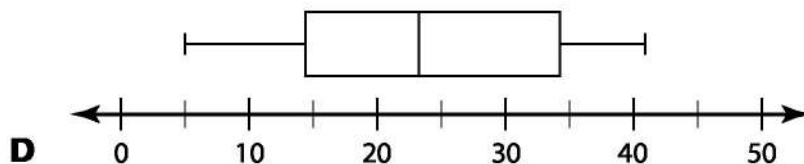
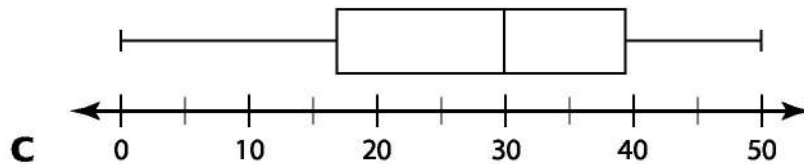
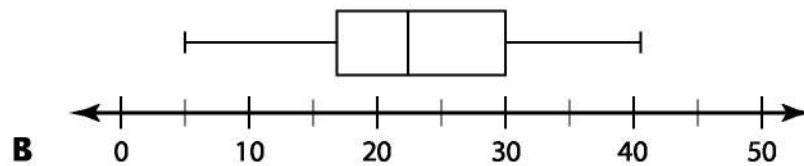
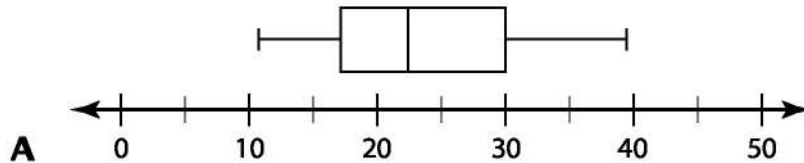
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Andre recorded the weights, in pounds, of all of his friends' dogs, as shown below.

5, 11, 14, 17, 18, 23, 30, 30, 34, 39, 41

Which box-and-whisker plot represents the data?

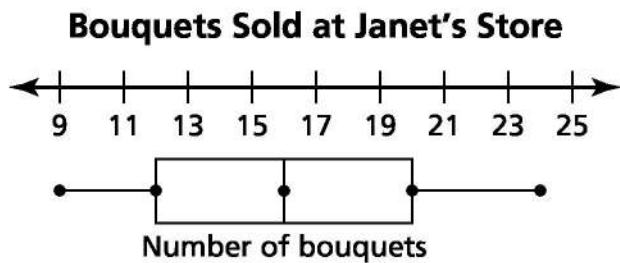


Content: Mathematics
Item Number: 49
Item ID: 01008323
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.DASP.2
Reporting Category: Data Analysis, Statistics & Probability



The box-and-whisker plot below shows the number of flower bouquets sold at Janet's store on different days.



What is the range of the bouquets sold?

- F** 7
- G** 8
- H** 12
- J** 15

Content: Mathematics
Item Number: 14
Item ID: 01173270
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.DASP.2
Reporting Category: Data Analysis, Statistics & Probability



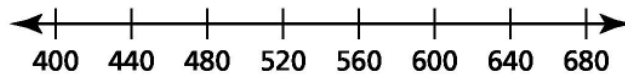
Gary created a website and recorded the number of visitors to the website each day for 7 days. The table below shows his data.

Website Visitors

Day	Number of Visitors
1	500
2	480
3	440
4	550
5	600
6	640
7	420

- A** Use the number line in the answer booklet to create a box-and-whisker plot to represent this data.
- B** Name one measure of central tendency that cannot be calculated from a box-and-whisker plot alone. Write your answer on the line in the answer booklet.

A



B _____

Content: Mathematics
Item Number: 32
Item ID: 01173276
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: 8.DASP.2
Reporting Category: Data Analysis, Statistics & Probability



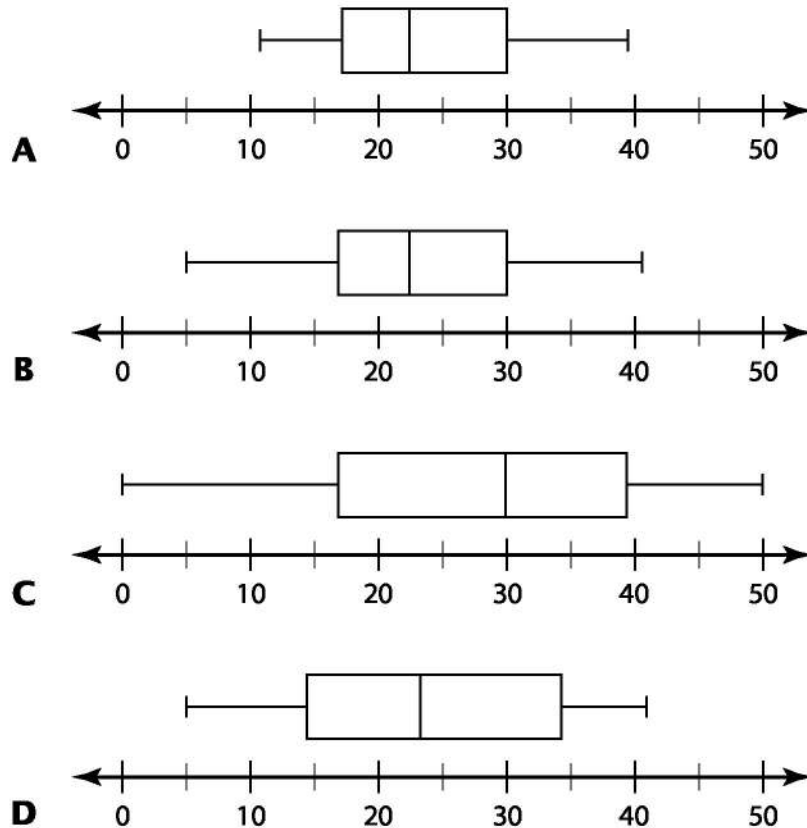
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Andre recorded the weights, in pounds, of all of his friends' dogs, as shown below.

5, 11, 14, 17, 18, 23, 30, 30, 34, 39, 41

Which box-and-whisker plot represents the data?



Content: Mathematics
Item Number: 49
Item ID: 01008323
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.DASP.2
Reporting Category: Data Analysis, Statistics & Probability



Wendy hit a golf shot 20 times. The table below shows where each shot landed.

green	
sand trap	
rough	
water	

According to the data, what is the probability of Wendy hitting her next shot onto the green?

- A** $\frac{1}{8}$
- B** $\frac{2}{5}$
- C** $\frac{3}{5}$
- D** $\frac{2}{3}$

Content: Mathematics
Item Number: 17
Item ID: 01008311
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.DASP.4
Reporting Category: Data Analysis, Statistics & Probability



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The table below shows the number of cups of each flavor of coffee sold at a coffee shop one morning.

Flavored Coffee

Flavor	Number of cups sold
Almond Nut Cream	11
Butter Pecan	9
Blueberry	7
Banana Nut Cream	3

Using the data, estimate the probability the next cup sold will not be butter pecan coffee.

A $\frac{3}{10}$

C $\frac{12}{21}$

B $\frac{7}{10}$

D $\frac{29}{30}$

Content: Mathematics
Item Number: 35
Item ID: 01173260
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.DASP.4
Reporting Category: Data Analysis, Statistics & Probability



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Tim needs a swimming suit, towel, sunglasses, and a hat to go to the beach. The sporting goods store has 10 styles of swimming suits, 6 kinds of towels, 5 styles of sunglasses, and 8 styles of hats. How many different combinations can Tim select?

- A** 29
- B** 240
- C** 300
- D** 2,400

Content: Mathematics
Item Number: 5
Item ID: 01008347
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.DASP.6
Reporting Category: Data Analysis, Statistics & Probability



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Jabari has 50 colored pencils in a box. He has an 8% chance of randomly selecting a green pencil. How many green pencils does Jabari have in a box?

- F** 4
- G** 8
- H** 16
- J** 40

Content: Mathematics
Item Number: 48
Item ID: 00881926
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.DASP.6
Reporting Category: Data Analysis, Statistics & Probability



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Cory has two number cubes, each with faces labeled 1 through 6. Cory rolls both number cubes. What is the probability that both number cubes show a 4?

F $\frac{1}{36}$

G $\frac{1}{16}$

H $\frac{1}{6}$

J $\frac{1}{4}$

Content: Mathematics
Item Number: 66
Item ID: 01008331
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.DASP.6
Reporting Category: Data Analysis, Statistics & Probability



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- F** 4
- G** 8
- H** 16
- J** 40

Content: Mathematics
Item Number: 48
Item ID: 00881926
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.DASP.6
Reporting Category: Data Analysis, Statistics & Probability



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Which of the following are dependent events?

- F** flipping a coin 20 times
- G** rolling a number cube 5 times
- H** selecting 5 letters for a password, letters can be repeated
- J** drawing for the winners of first, second, and third prize in a contest

Content: Mathematics
Item Number: 24
Item ID: 01008343
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.DASP.7
Reporting Category: Data Analysis, Statistics & Probability



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Each week Ms. Jackson puts all the students' names in a box and draws a winner for a prize. Zoe won the prize last week. What is the probability that Zoe will win the prize next week?

- F** less than the other students
- G** the same as the other students
- H** more than the other students
- J** zero probability

Content: Mathematics
Item Number: 64
Item ID: 01008325
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.DASP.7
Reporting Category: Data Analysis, Statistics & Probability



Jack, Paula, Mike, Seth, Tara, and Blake are participating in a running race. Each of them has to run in one of 6 different lanes on the track. Mike is allotted lane number 2. In how many different ways can the remaining five runners be allotted their lanes?

- F** 10
- G** 25
- H** 120
- J** 720

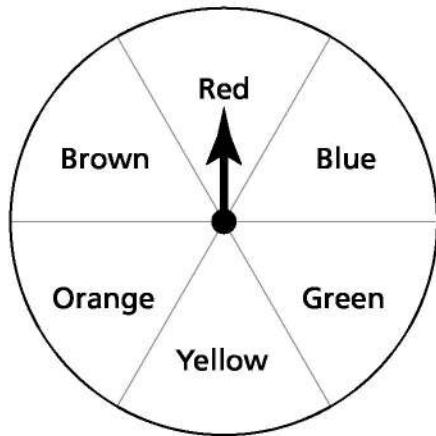
Content: Mathematics
Item Number: 70
Item ID: 01173268
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.DASP.7
Reporting Category: Data Analysis, Statistics & Probability



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Amy is playing with the spinner shown below.



Which of these expressions can be used to find the probability of the arrow landing on red 4 times in a row?

F $\frac{1}{6} \times \frac{1}{5} \times \frac{1}{4} \times \frac{1}{3}$

G $\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6} \times \frac{1}{6}$

H $\frac{1}{6} + \frac{1}{5} + \frac{1}{4} + \frac{1}{3}$

J $\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6}$

Content: Mathematics
Item Number: 70
Item ID: 01173290
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.DASP.7
Reporting Category: Data Analysis, Statistics & Probability



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Talia measured all but one angle of a hexagon. The total degree measure for all of the angles she measured was 550° . What is the measure, in degrees, of the remaining angle?

- A** 120°
- B** 170°
- C** 180°
- D** 720°

Content: Mathematics
Item Number: 3
Item ID: 00789850
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.G.1
Reporting Category: Geometry



The sum of the interior angles of a polygon is 720° . How many sides does this polygon have?

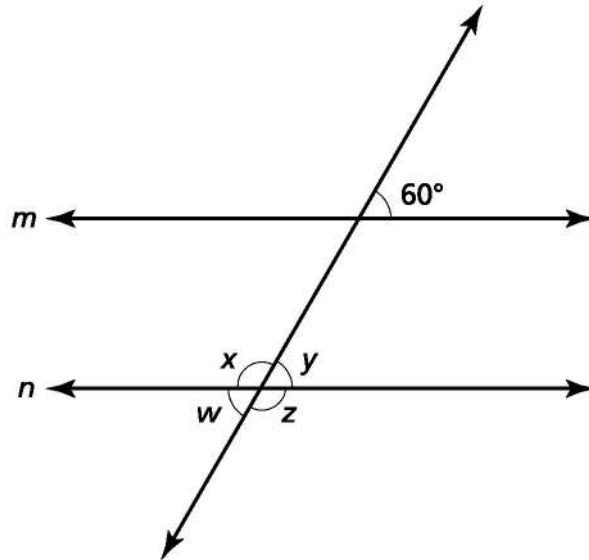
- F** 4
- G** 5
- H** 6
- J** 8

Content: Mathematics
Item Number: 30
Item ID: 01008309
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.G.1
Reporting Category: Geometry



The lines m and n are parallel in the figure below.



Which angles also have a measure of 60° ?

- F** $\angle w$ and $\angle x$
- G** $\angle x$ and $\angle z$
- H** $\angle y$ and $\angle z$
- J** $\angle w$ and $\angle y$

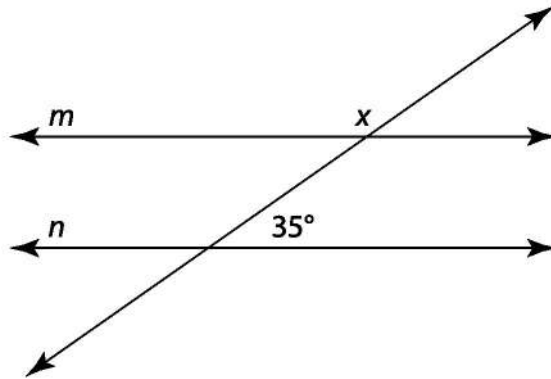
Content: Mathematics
Item Number: 34
Item ID: 01173258
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.G.2
Reporting Category: Geometry



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Lines m and n are parallel in the figure below.



What is the measure of angle x ?

- A** 35°
- B** 55°
- C** 145°
- D** 165°

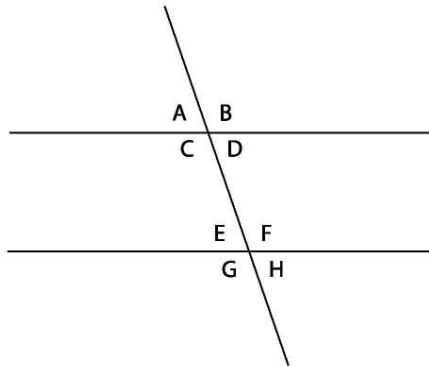
Content: Mathematics
Item Number: 45
Item ID: 01008305
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.G.2
Reporting Category: Geometry



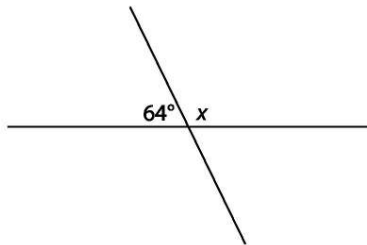
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A Look at the figure below.



In this figure, parallel lines cut by a transversal are shown. On the line in the answer booklet, list all of the angles that have the same measure as angle A.

B Look at the figure below.



Note: The figure is not drawn to scale.

What is the measure of angle x ? In the box in the answer booklet, show your work and write your answer on the line.

A _____

B

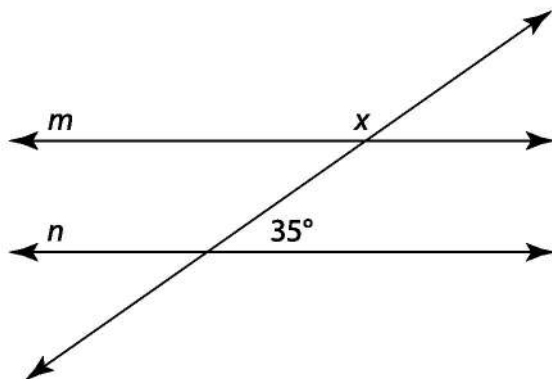
_____ degrees

Content: Mathematics
 Item Number: 59
 Item ID: 01008339
 Item Type: Constructed Response

Answer Key:
 Max. score points: 3
 Standard: 8.G.2
 Reporting Category: Geometry



Lines m and n are parallel in the figure below.



What is the measure of angle x ?

- A** 35°
- B** 55°
- C** 145°
- D** 165°

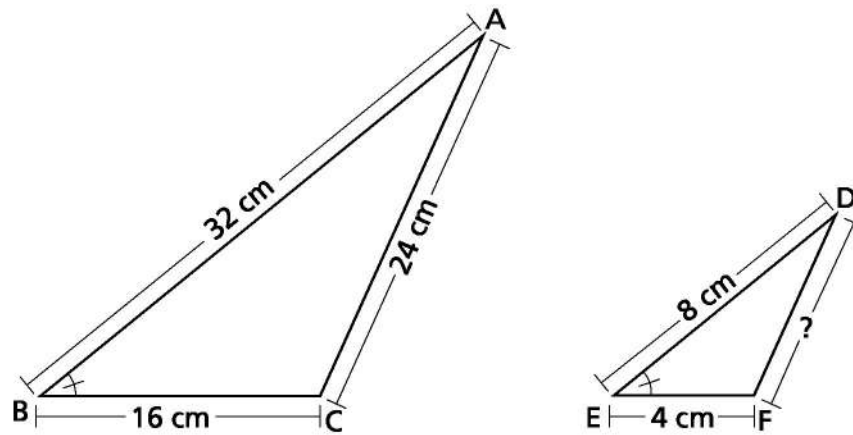
Content: Mathematics
Item Number: 45
Item ID: 01008305
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.G.2
Reporting Category: Geometry



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Look at the figures below.



Note: The figures are not drawn to scale.

What is the length of \overline{DF} ?

- A** 6 cm
- B** 7 cm
- C** 12 cm
- D** 16 cm

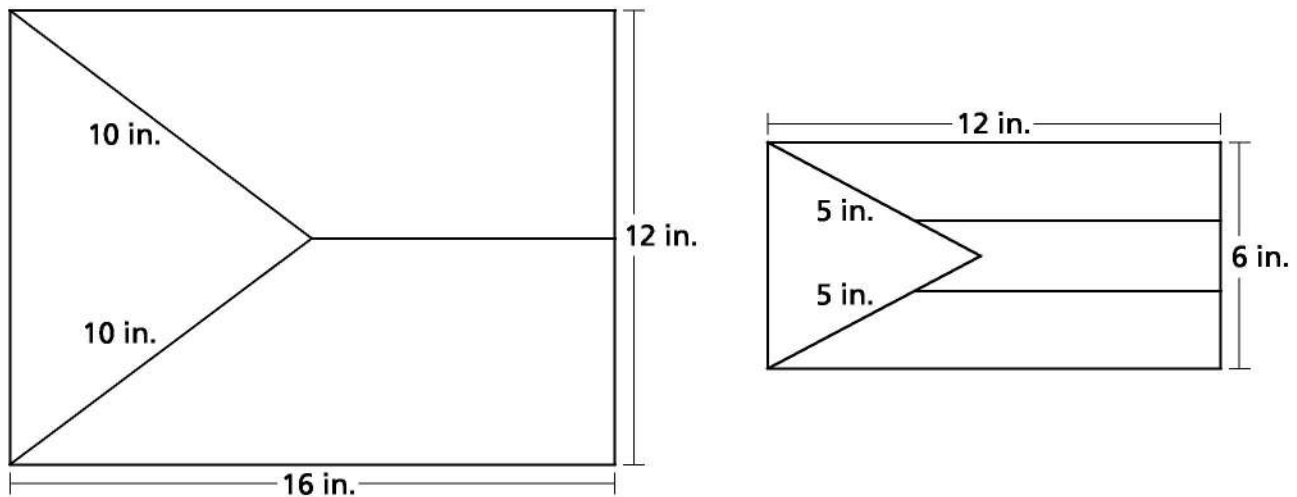
Content: Mathematics
Item Number: 11
Item ID: 00881983
Item Type: Multiple Choice

Answer Key: A
Max. score points: 1
Standard: 8.G.3
Reporting Category: Geometry



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Andrea made some flags for an international conference. She observed that the triangles in the flags of two countries were similar. The two flags are shown in the picture below.



Which of these statements indicates that the two triangles are similar?

- A** Both the triangles are isosceles triangles.
- B** The sum of the measures of the angles in both the triangles is 180° .
- C** The ratios of all corresponding angles of the two triangles are equal.
- D** The ratios of all pairs of corresponding sides of the two triangles are equal.

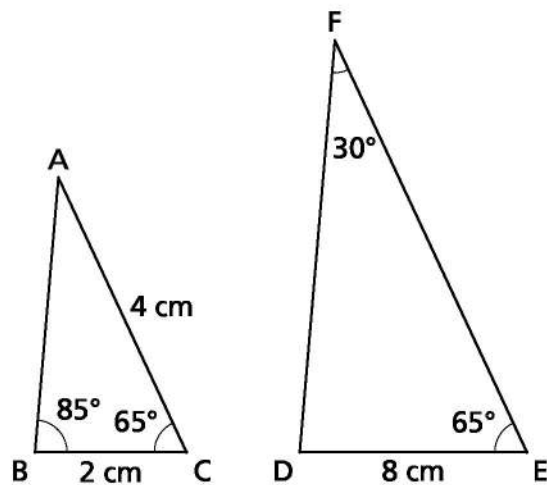
Content: Mathematics
Item Number: 69
Item ID: 01173266
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.G.3
Reporting Category: Geometry



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Look at the two triangles in the figure below.



What is the length, in centimeters (cm), of \overline{EF} in $\triangle DEF$?

- A** 10
- B** 12
- C** 14
- D** 16

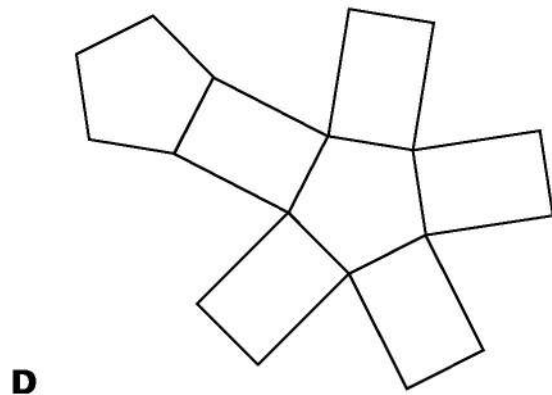
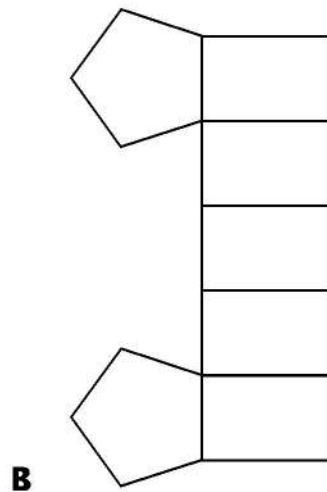
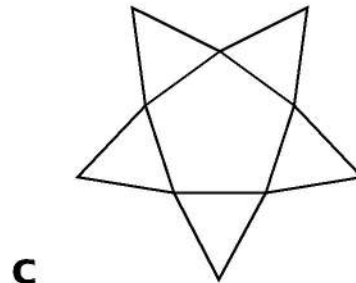
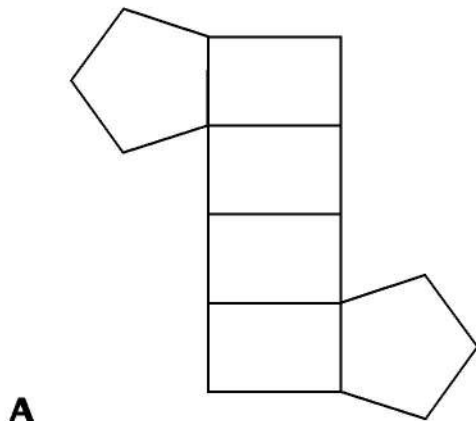
Content: Mathematics
Item Number: 69
Item ID: 01173288
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.G.3
Reporting Category: Geometry



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Which of the nets below could be folded to make a pentagonal prism?

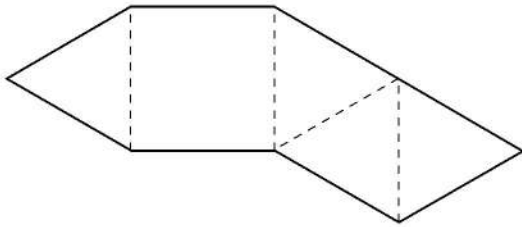


Content: Mathematics
 Item Number: 9
 Item ID: 01008337
 Item Type: Multiple Choice

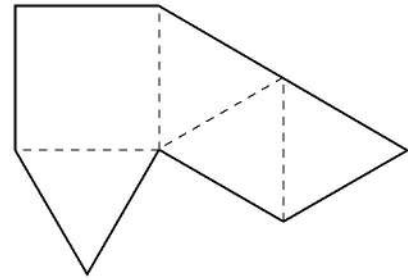
Answer Key: D
 Max. score points: 1
 Standard: 8.G.5
 Reporting Category: Geometry



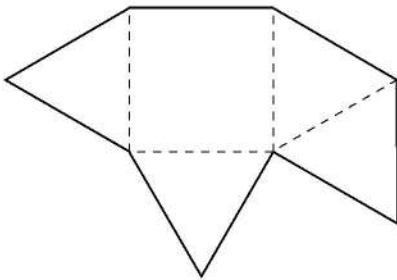
Which of these nets (diagrams) will form a square pyramid?



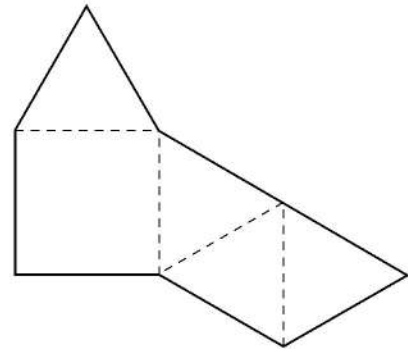
F



H



G



J

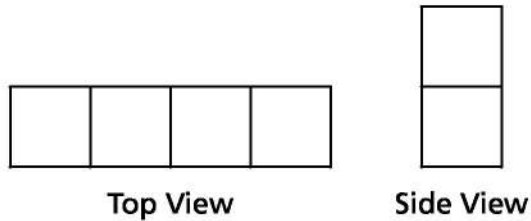
Content: Mathematics
Item Number: 22
Item ID: 00881851
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.G.5
Reporting Category: Geometry

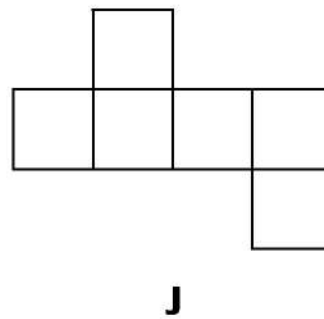
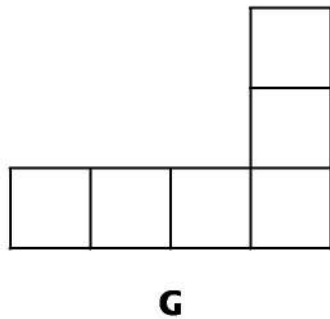
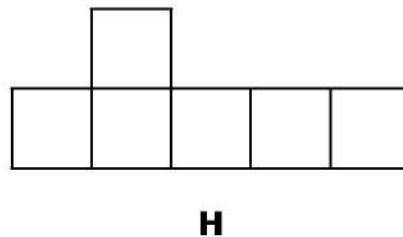
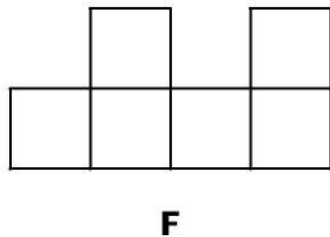


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Jacob made the model of an office building using 6 cubes. The top view and the side view of the model are shown below.



Which of these could be the front view of his model?

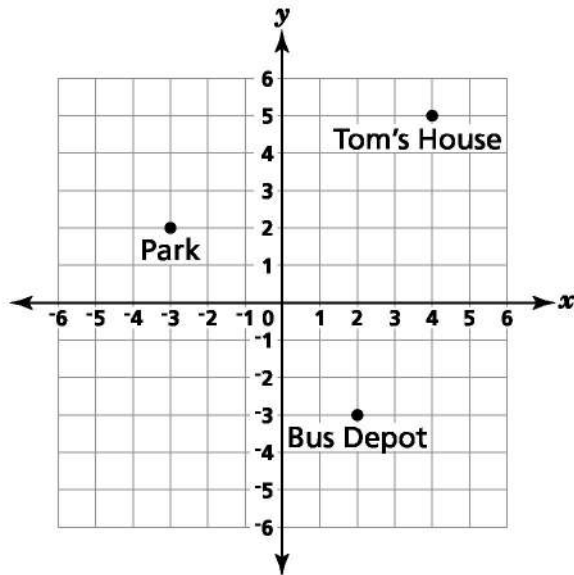


Content: Mathematics
Item Number: 16
Item ID: 01173274
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.G.5
Reporting Category: Geometry



The coordinate grid below shows the locations of some places near Tom's house.



$$\text{Midpoint} = \left(\frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2} \right)$$

If Tom's school is located midway between the bus depot and Tom's house, what are the coordinates of the location of his school?

- A** (1, 3)
- B** (1, 4)
- C** (3, 1)
- D** (3, 2)

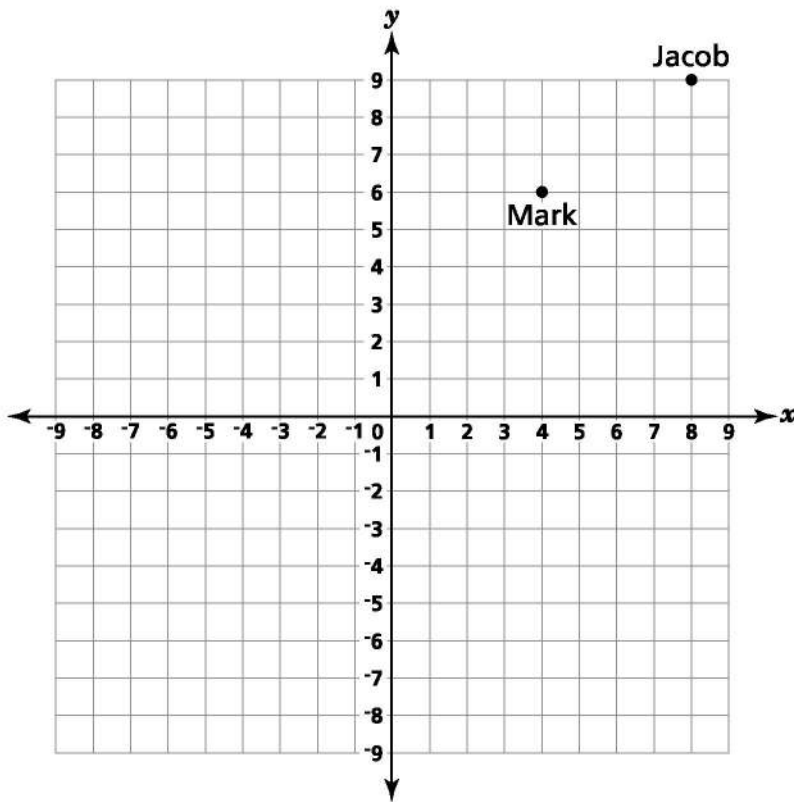
Content: Mathematics
Item Number: 51
Item ID: 01173165
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.G.6
Reporting Category: Geometry



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The grid below shows the positions of two runners, Mark and Jacob, at the start of a relay race.



$$\text{Distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

What is the distance between Mark and Jacob?

- A** 3 units
- B** 4 units
- C** 5 units
- D** 7 units

Content: Mathematics
Item Number: 35
Item ID: 01173282
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.G.6
Reporting Category: Geometry



Kim has a 5-gallon jug. Approximately how many liters of water will this jug hold?

1 gallon \approx 3.79 liters

- A** 0.76 liters
- B** 1.32 liters
- C** 15.79 liters
- D** 18.95 liters

Content: Mathematics
Item Number: 1
Item ID: 01008317
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.M.1
Reporting Category: Measurement



At the Russian ice station Vostok in Antarctica, the lowest temperature recorded is -89.2°C rounded to the nearest tenth. What is this temperature in $^{\circ}\text{F}$?

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 1.8) + 32$$

- F** -192.6°F
- G** -128.6°F
- H** -67.3°F
- J** -57.2°F

Content: Mathematics
Item Number: 38
Item ID: 00881906
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.M.1
Reporting Category: Measurement



Richard drove a distance of 85 miles from Montgomery to Birmingham. Approximately how many kilometers did Richard drive?

1 mile \approx 1.61 kilometers

- F** 52.80
- G** 86.61
- H** 98.60
- J** 136.85

Content: Mathematics
Item Number: 42
Item ID: 01173161
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.M.1
Reporting Category: Measurement



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An elephant weighs 11,643 pounds. Which equation can be used to find its weight in kilograms (w)?

1 kilogram \approx 2.2 pounds

- A** $11,643 \times 2.2 = w$
- B** $11,643 \div 2.2 = w$
- C** $w \times 11,643 = 2.2$
- D** $w \div 11,643 = 2.2$

Content: Mathematics
Item Number: 53
Item ID: 01008357
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.M.1
Reporting Category: Measurement



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At the Russian ice station Vostok in Antarctica, the lowest temperature recorded is -89.2°C rounded to the nearest tenth. What is this temperature in $^{\circ}\text{F}$?

$$^{\circ}\text{F} = (^{\circ}\text{C} \times 1.8) + 32$$

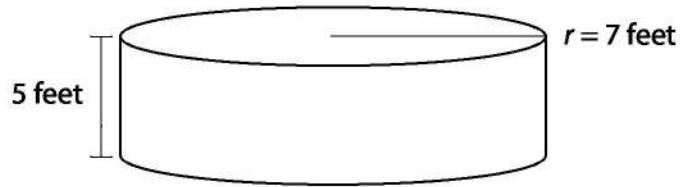
- F** -192.6°F
- G** -128.6°F
- H** -67.3°F
- J** -57.2°F

Content: Mathematics
Item Number: 38
Item ID: 00881906
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.M.1
Reporting Category: Measurement



The diagram below shows a pool.



What is the volume, to the nearest cubic foot, of this pool? Use 3.14 for π .

$$\text{Volume of Cylinder} = \pi r^2 h$$

- A** 220 cubic feet
- B** 550 cubic feet
- C** 769 cubic feet
- D** 3,847 cubic feet

Content: Mathematics
Item Number: 37
Item ID: 01008319
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.M.2
Reporting Category: Measurement



Office of the State Superintendent of Education
DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Julie made chocolate balls, each with a radius of 3.5 centimeters.

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

- A** What is the approximate volume, in cubic centimeters, of chocolate in each chocolate ball (rounded to the nearest whole number)? Show your work in the box in the answer booklet and write your answer on the line.
- B** Julie plans to wrap each chocolate ball in silver foil. What is the minimum area, in square centimeters, of silver foil required to wrap each chocolate ball, without any overlap? Round your answer to the nearest whole number. Show your work in the box in the answer booklet and write your answer on the line.

A		_____ cm^3
B		_____ cm^2

Content: Mathematics
Item Number: 43
Item ID: 01173163
Item Type: Constructed Response

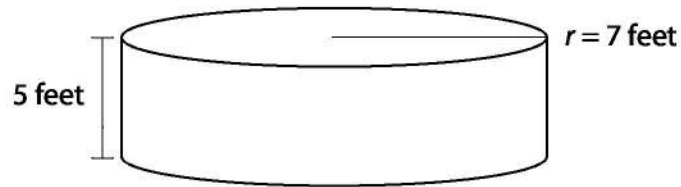
Answer Key:
Max. score points: 3
Standard: 8.M.2
Reporting Category: Measurement



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The diagram below shows a pool.



What is the volume, to the nearest cubic foot, of this pool? Use 3.14 for π .

$$\text{Volume of Cylinder} = \pi r^2 h$$

- A** 220 cubic feet
- B** 550 cubic feet
- C** 769 cubic feet
- D** 3,847 cubic feet

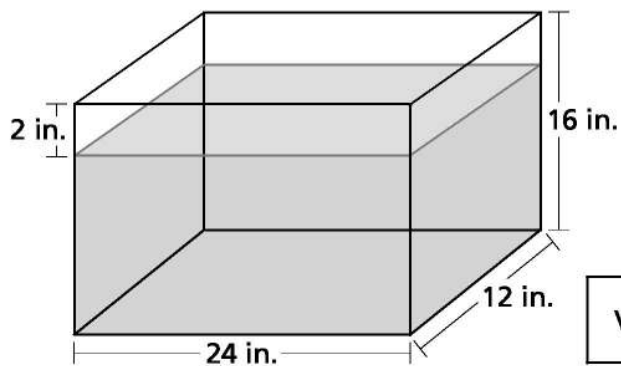
Content: Mathematics
Item Number: 37
Item ID: 01008319
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.M.2
Reporting Category: Measurement



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The figure below shows a fish tank with water.



Volume of a rectangular prism = length \times width \times height

What is the volume, in cubic inches, of water in the tank?

- F** 2,304
- G** 3,080
- H** 4,032
- J** 4,608

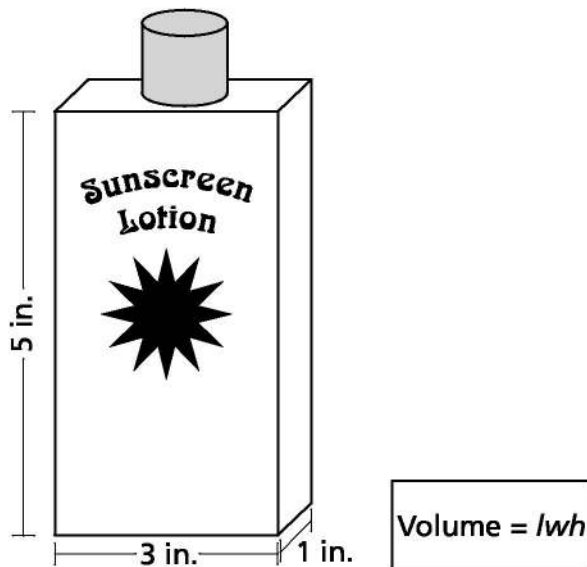
Content: Mathematics
Item Number: 40
Item ID: 01173147
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.M.2
Reporting Category: Measurement



Office of the State Superintendent of Education
DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

A company sells sunscreen lotion in a container that is in the shape of a right rectangular prism. A diagram of the container and its dimensions are shown below.



The company wants to increase the volume of the container by 20%. If the length, 3 inches, and width, 1 inch, remain the same, what should be the height, in inches, of the new container?

3

A

6

B

8

C

15

D

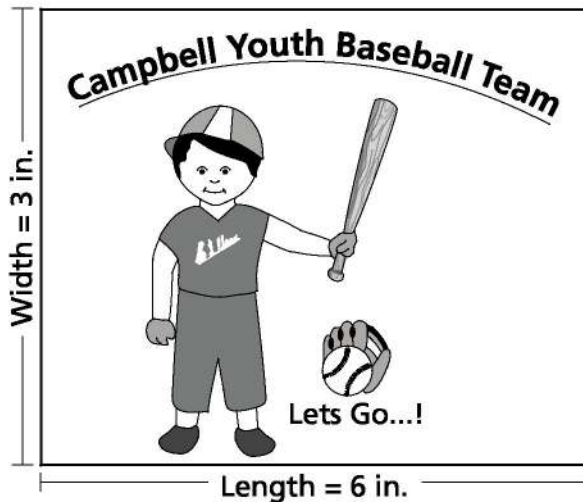
Content: Mathematics
Item Number: 39
Item ID: 00881912
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.M.4
Reporting Category: Measurement



Office of the State Superintendent of Education
DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The figure below shows the scale drawing of a banner made to advertise for the baseball team.



If the actual banner has a length of 48 inches, what is the area of the actual banner, in square inches?

- F** 144
- G** 864
- H** 1,152
- J** 4,608

Content: Mathematics
Item Number: 42
Item ID: 01173151
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.M.4
Reporting Category: Measurement



Office of the State Superintendent of Education
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MAYOR ADRIAN M. FENTY

Kayla's teacher handed out the following information at the beginning of the school year.

Grade Distribution

Tests	70%
Quizzes	20%
Homework	10%

- A** Kayla has a homework grade of 96, a quiz grade of 68, and a test grade of 84. What overall grade will she earn for the class? Show your work in the box in the answer booklet and write your answer on the line.
- B** Kayla would like to raise her overall grade by 7 points. If her homework and quiz grades remain the same, by how many points does Kayla need to raise her test grade? Write your answer on the line in the answer booklet.

A	
B	_____ points

Content: Mathematics
Item Number: 43
Item ID: 01173153
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: 8.NSO-C.8
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

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MAYOR ADRIAN M. FENTY

On Saturday, Alexia drove 360 miles in 8 hours. At this rate, how far had she driven in 6 hours?

45 miles

F

60 miles

G

180 miles

H

270 miles

J

Content: Mathematics
Item Number: 4
Item ID: 00881914
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.NSO-C.9
Reporting Category: Number Sense & Operations



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MAYOR ADRIAN M. FENTY

On Wednesday, Ruben drove 220 miles in the first 4 hours, and 260 miles in the second 4 hours. What was his average rate of speed for the 8 hours?

- A** 50 mph
- B** 55 mph
- C** 60 mph
- D** 65 mph

Content: Mathematics
Item Number: 7
Item ID: 01008351
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.NSO-C.9
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education
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MAYOR ADRIAN M. FENTY

A shoe factory makes the same number of shoes each hour.

- By 1:00 pm, the factory made 240 shoes.
- By 5:00 pm, the factory made 432 shoes.

How many shoes does this factory make in 1 hour?

- A** 48
- B** 64
- C** 192
- D** 240

Content: Mathematics
Item Number: 57
Item ID: 01008329
Item Type: Multiple Choice

Answer Key: A
Max. score points: 1
Standard: 8.NSO-C.9
Reporting Category: Number Sense & Operations



At a bank, Mr. Johnson exchanged U.S. dollars for British pounds. If the exchange rate on that day was 4 U.S. dollars for 2 British pounds, how many British pounds did Mr. Johnson receive if he exchanged 24 U.S. dollars?

- A** 3
- B** 6
- C** 12
- D** 48

Content: Mathematics
Item Number: 67
Item ID: 01173262
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.NSO-C.9
Reporting Category: Number Sense & Operations



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MAYOR ADRIAN M. FENTY

William works at a restaurant where an employee's performance is rated on a 5-point scale. The table below shows his overall performance rating.

Employee Performance

Rating From	Weight	Points
Supervisor	50%	4
Co-workers	20%	3
Customers	30%	3.5

For his performance rating, William receives 4 points from the supervisor, 3 points from his co-workers, and 3.5 from the customers. What is the weighted average of his scores?

- A** 3
- B** 3.35
- C** 3.5
- D** 3.65

Content: Mathematics
Item Number: 41
Item ID: 01173159
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.NSO-C.10
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

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MAYOR ADRIAN M. FENTY

- A** Ms. Martinez runs a store. She pays \$0.75 for a can of soup. She sells the soup for 80% more than she pays for it. What is the selling price of the soup? In the box in the answer booklet, show your work and write your answer on the line.
- B** Ms. Martinez puts \$2,400 in a savings account. She receives 4% interest on her money per year. How much money will there be in the savings account after one year? In the box in the answer booklet, show your work and write your answer on the line.

A

\$ _____

B

\$ _____

Content: Mathematics
Item Number: 6
Item ID: 01008353
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: 8.NSO-C.11
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education

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MAYOR ADRIAN M. FENTY

Leon bought a book for \$20 and sold it for \$25. What percentage profit did he make?

- A** 5%
- B** 20%
- C** 25%
- D** 45%

Content: Mathematics
Item Number: 15
Item ID: 01173272
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.NSO-C.11
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education
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MAYOR ADRIAN M. FENTY

A circular section of lawn is watered by a sprinkler. The area watered by the sprinkler is 64π square feet. What is the radius of this circular section of lawn?

$$\text{Area of Circle} = \pi r^2$$

r = radius

- F** 4 feet
- G** 8 feet
- H** 16 feet
- J** 32 feet

Content: Mathematics
Item Number: 18
Item ID: 01008313
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.NSO-C.13
Reporting Category: Number Sense & Operations



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MAYOR ADRIAN M. FENTY

What is the value of the expression $(4 \times 10^{-6}) \times (5 \times 10^9)$ in scientific notation?

- A** 2×10^3
- B** 2×10^4
- C** 20×10^3
- D** 20×10^{-15}

Content: Mathematics
Item Number: 33
Item ID: 01173278
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.NSO-C.15
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education
DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Michael bought a total of 15 packages of paper cups and paper plates. The table below shows the cost of each package.

Paper Plates and Cups

Item	Cost Per Packet
Paper plates	\$6.50
Paper cups	\$4.20

If $\frac{2}{3}$ of the total number of packages Michael bought were paper cups, what was the total cost of the 15 packages?

- A** \$74.50
- B** \$86
- C** \$114
- D** \$160.50

Content: Mathematics
Item Number: 67
Item ID: 01173284
Item Type: Multiple Choice

Answer Key: A
Max. score points: 1
Standard: 8.NSO-C.15
Reporting Category: Number Sense & Operations



Julian weighed some rocks on a scientific scale. The weight, in kilograms, of each rock is shown below.

5.85	2.4	1.275	1.28	3.3
------	-----	-------	------	-----

What is the total weight of these rocks, to the nearest kilogram?

- A** 12 kilograms
- B** 13 kilograms
- C** 14 kilograms
- D** 15 kilograms

Content: Mathematics
Item Number: 31
Item ID: 01008345
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.NSO-E.17
Reporting Category: Number Sense & Operations



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James bought 2 tickets for a school play. Each ticket cost \$4.35. During intermission, James went to the snack bar and bought 2 candy bars for \$1.25 each and 2 sodas for \$0.85 each. Which of these is the best estimate of the total amount of money James spent?

- F** between \$5 and \$7
- G** between \$8 and \$10
- H** between \$12 and \$14
- J** between \$15 and \$17

Content: Mathematics
Item Number: 56
Item ID: 00881918
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.NSO-E.17
Reporting Category: Number Sense & Operations



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MAYOR ADRIAN M. FENTY

$$\frac{3 \times 4}{\frac{1}{13}} =$$

F 0.54

G 0.92

H 91

J 156

Content: Mathematics
Item Number: 46
Item ID: 00881987
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.NSO-N.1
Reporting Category: Number Sense & Operations



Which of these is an irrational number?

F $\frac{5}{6}$

G $\sqrt{4}$

H $10\sqrt{3}$

J 12.25

Content: Mathematics
Item Number: 20
Item ID: 00881847
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.NSO-N.2
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education
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MAYOR ADRIAN M. FENTY

Which of the numbers in the list below are irrational numbers?

$\sqrt{9}, 4\pi, 2.8, -5, 0.1245\dots, \sqrt{8}$
--

- A** $\sqrt{9}, 2.8, -5$
B $\sqrt{9}, 4\pi, \sqrt{8}$
C $2.8, 0.1245\dots$
D $4\pi, 0.1245\dots, \sqrt{8}$

Content: Mathematics
Item Number: 33
Item ID: 01173256
Item Type: Multiple Choice

Answer Key: D
Max. score points: 1
Standard: 8.NSO-N.5
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education
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MAYOR ADRIAN M. FENTY

Which number has the greatest value?

F $2\sqrt{2}$

G $\sqrt{3}$

H π

J $\sqrt{5}$

Content: Mathematics
Item Number: 58
Item ID: 01008359
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.NSO-N.5
Reporting Category: Number Sense & Operations



Which expression has the same value as
 $5^4 \times 5^2 \times 3^2 \times 3^3$?

- F** 15^{11}
- G** $5^6 \times 3^5$
- H** $5^8 \times 3^6$
- J** $25^6 \times 9^5$

Content: Mathematics
Item Number: 8
Item ID: 01008333
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.NSO-N.6
Reporting Category: Number Sense & Operations



What is the simplified form of the expression $(5^2)^{-2} \div 5^3$?

- A** 5^{-1}
- B** 5^{-3}
- C** 5^{-7}
- D** 5^{-12}

Content: Mathematics
Item Number: 15
Item ID: 01173250
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.NSO-N.6
Reporting Category: Number Sense & Operations



Office of the State Superintendent of Education
DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Look at the table below.

x	y
1	6
2	11
3	16
4	21

Which equation is represented by the table?

A $y = x + 5$

B $y = 5x + 5$

C $y = 5x + 1$

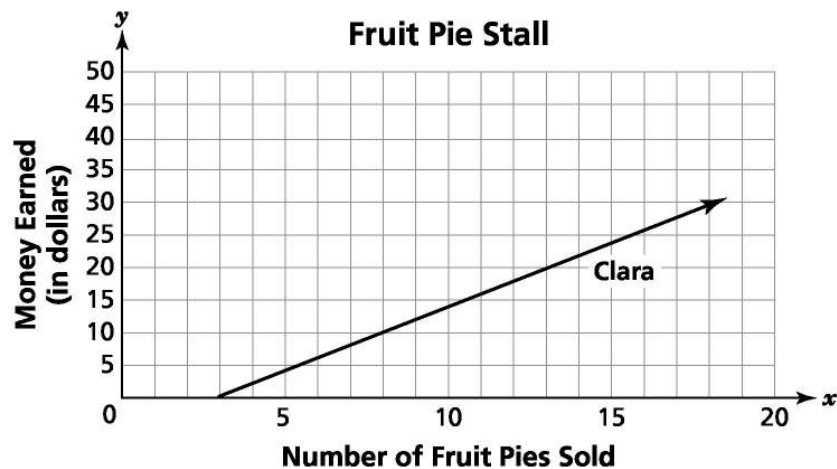
D $y = \frac{1}{5}x + 1$

Content: Mathematics
Item Number: 19
Item ID: 00881928
Item Type: Multiple Choice

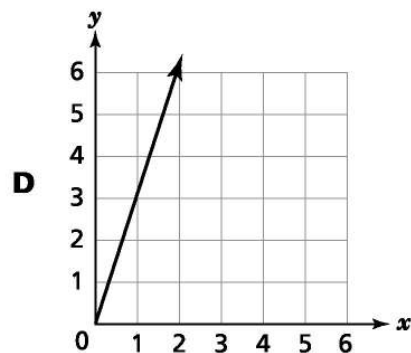
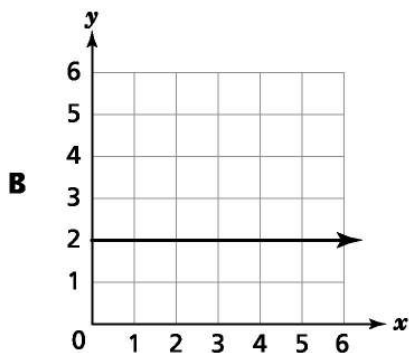
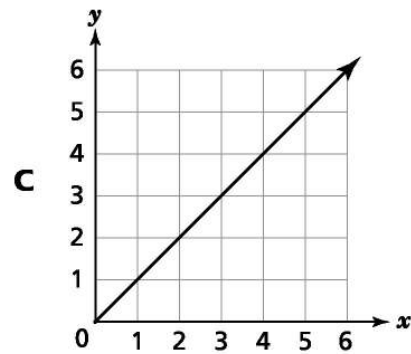
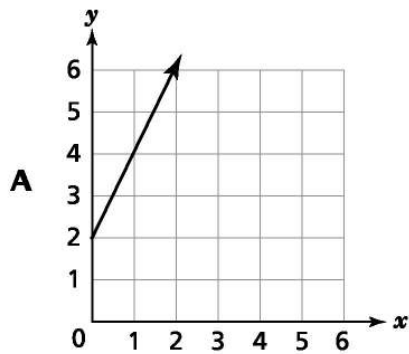
Answer Key: C
Max. score points: 1
Standard: 8.PRA.1
Reporting Category: Patterns, Relations & Algebra



The table below shows the profit Clara made at her fruit pie stall at the community bake sale.



Which of these line graphs has a greater slope than the rate of profit Clara made?



Content: Mathematics
 Item Number: 51
 Item ID: 01173155
 Item Type: Multiple Choice

Answer Key: D
 Max. score points: 1
 Standard: 8.PRA.1
 Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
 MAYOR ADRIAN M. FENTY

Look at the cost of printing photos (p) at two different photo shops below.

$$C = 0.15p + 1$$

$$C = 0.25p + 0.4$$

Printing how many photos would cost the same at both photo shops?

- F** 2
- G** 4
- H** 6
- J** 14

Content: Mathematics
Item Number: 2
Item ID: 01008315
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.PRA.2
Reporting Category: Patterns, Relations & Algebra



Look at the two equations below.

$$y = 3x + 4$$

$$y = 2x + 6$$

Which of these is a solution to both equations?

F $x = 3, y = 13$

G $x = 10, y = 2$

H $x = 2, y = 10$

J $x = 13, y = 3$

Content: Mathematics
Item Number: 12
Item ID: 00881849
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.PRA.2
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Joshua has \$25.00 to spend at a book fair. The admission cost for the book fair is \$5.00. All books cost \$2.50. Which inequality can be used to find the number of books, b , Joshua can buy at the book fair?

- A** $2.50b + 5.00 \leq 25.00$
- B** $2.50b + 5.00 \geq 25.00$
- C** $2.50 + 5.00b \leq 25.00$
- D** $2.50 + 5.00b \geq 25.00$

Content: Mathematics
Item Number: 13
Item ID: 01008303
Item Type: Multiple Choice

Answer Key: A
Max. score points: 1
Standard: 8.PRA.2
Reporting Category: Patterns, Relations & Algebra



The table below shows the number of students attending State College over a 4-year period.

Year	Number of Students
0	5,150
1	5,225
2	5,300
3	5,375

- A** If the school continues to grow at the same rate, how many students will be attending State College in year 7? In the box in the answer booklet, show your work and write your answer on the line.
- B** On the lines in the answer booklet, write an equation representing the data in the table and define the variables you use in your equation.

A

_____ students in year 7

B

Content: Mathematics
Item Number: 29
Item ID: 01008307
Item Type: Constructed Response

Answer Key:
Max. score points: 3
Standard: 8.PRA.2
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

The Amazon rainforest had an average rainfall of 135 feet over a 15-year period. If the rate of rainfall remains the same, which of these equations can best be used to calculate the average rainfall (x), in feet, the Amazon rainforest will have over a 20.5-year period?

F $\frac{20.5}{x} = \frac{15}{135}$

G $\frac{x}{20.5} = \frac{15}{135}$

H $\frac{x}{135} = \frac{15}{20.5}$

J $\frac{135}{x} = \frac{20.5}{15}$

Content: Mathematics
Item Number: 14
Item ID: 01173248
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.PRA.3
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Adrian reads 6 pages of a book in 15 minutes. Which equation can Adrian use to find the time, t , it will take him to read 80 pages?

- A** $t = 80 \times 15 \times 6$
- B** $t = 80 \times 6 \div 15$
- C** $t = 80 \times 15 \div 6$
- D** $t = 80 \div 6 \div 15$

Content: Mathematics
Item Number: 23
Item ID: 01008341
Item Type: Multiple Choice

Answer Key: C
Max. score points: 1
Standard: 8.PRA.3
Reporting Category: Patterns, Relations & Algebra



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MAYOR ADRIAN M. FENTY

A movie theater charges \$1.50 for each soft drink. Each refill (r) costs \$0.25. Which of these equations can be used to calculate the total cost (C) of a soft drink with refills?

F $C = \$1.75r$

G $C = \$1.75 + r$

H $C = \$1.50r + \0.25

J $C = \$0.25r + \1.50

Content: Mathematics
Item Number: 28
Item ID: 00881859
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.PRA.3
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Eric is thinking about buying stock. The cost of 12 shares of GreyCo stock is \$20.64. Which of the following equations would be best for Eric to use to determine how much money he will need to buy 45 shares of GreyCo stock?

F $\frac{12}{20.64} = \frac{45}{x}$

G $\frac{20.64}{12} = \frac{45}{x}$

H $\frac{45}{12} = \frac{20.64}{x}$

J $\frac{45}{20.64} = \frac{12}{x}$

Content: Mathematics
Item Number: 36
Item ID: 00789848
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.PRA.3
Reporting Category: Patterns, Relations & Algebra



Samuel noticed that his company had hired 24 new employees over the last 3 years. If the hiring rate at his company remains the same, which proportion can be used to calculate x , the number of employees who will be hired over the next 6 years?

F $\frac{x}{6} = \frac{3}{24}$

G $\frac{x}{3} = \frac{6}{24}$

H $\frac{3}{x} = \frac{6}{24}$

J $\frac{6}{x} = \frac{3}{24}$

Content: Mathematics
Item Number: 68
Item ID: 01173286
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.PRA.3
Reporting Category: Patterns, Relations & Algebra



Office of the State Superintendent of Education

DISTRICT OF COLUMBIA
MAYOR ADRIAN M. FENTY

Which of these linear equations has the steepest slope?

F $y = 2x + 1$

G $y = -x + 5$

H $y = -3x + 2$

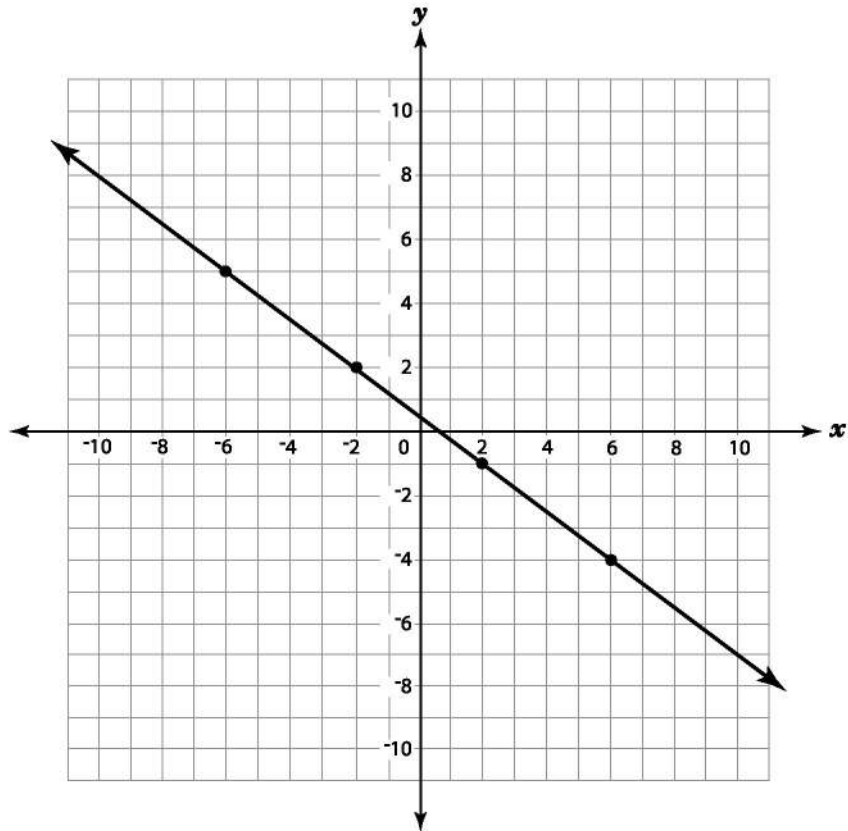
J $y = x + 3$

Content: Mathematics
Item Number: 40
Item ID: 01173157
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.PRA.4
Reporting Category: Patterns, Relations & Algebra



Look at the line graphed on the coordinate grid.



What is the slope of this line?

F -3

G $-\frac{3}{4}$

H $\frac{3}{4}$

J 4

Content: Mathematics
Item Number: 44
Item ID: 01173144
Item Type: Multiple Choice

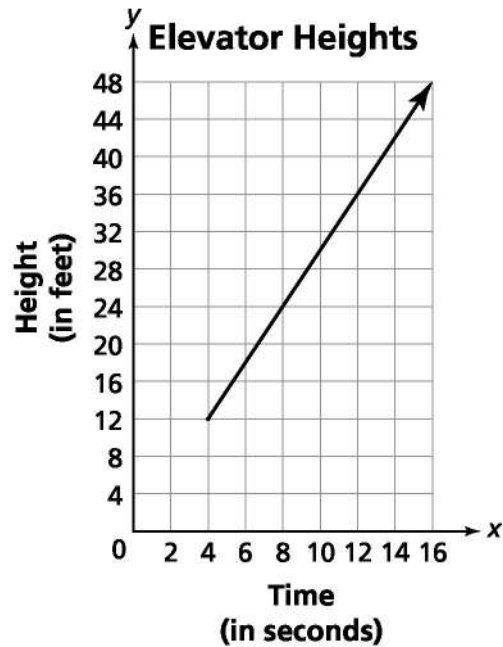
Answer Key: G
Max. score points: 1
Standard: 8.PRA.4
Reporting Category: Patterns, Relations & Algebra



The graph below shows y , the distance, in feet, a passenger elevator can rise in x seconds.

At what speed, in feet per second, can the elevator rise?

- A** 4
- B** 3
- C** 0.3
- D** 0.16

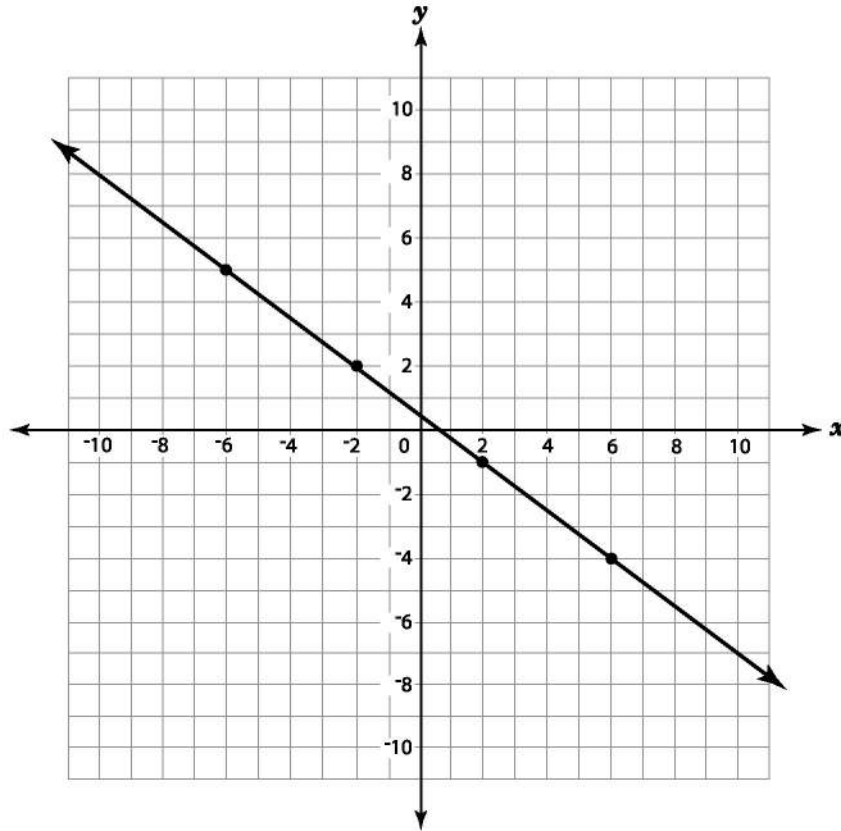


Content: Mathematics
Item Number: 41
Item ID: 01173149
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.PRA.4
Reporting Category: Patterns, Relations & Algebra



Look at the line graphed on the coordinate grid.



What is the slope of this line?

F -3

G $-\frac{3}{4}$

H $\frac{3}{4}$

J 4

Content: Mathematics
Item Number: 44
Item ID: 01173144
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.PRA.4
Reporting Category: Patterns, Relations & Algebra



Which of these functions has a slope of 6 and a y-intercept of 3 ?

A $y = 2x + 18$

B $y = 6x + 3$

C $y = 3x + 6$

D $y = 18x + 2$

Content: Mathematics
Item Number: 25
Item ID: 00881898
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.PRA.5
Reporting Category: Patterns, Relations & Algebra



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Look at the equation below.

$$y = \frac{1}{2}x + 4$$

What is the y-intercept of the line?

F 8

G 4

H $\frac{1}{2}$

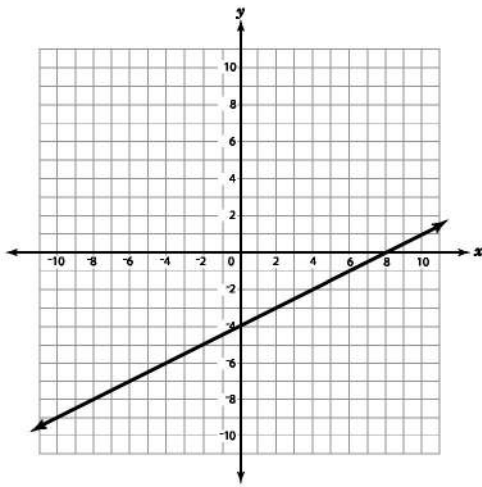
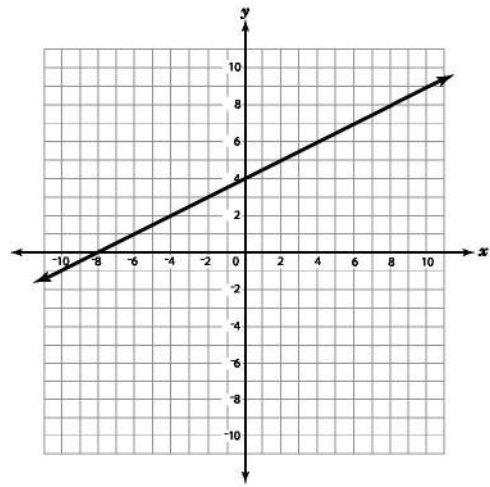
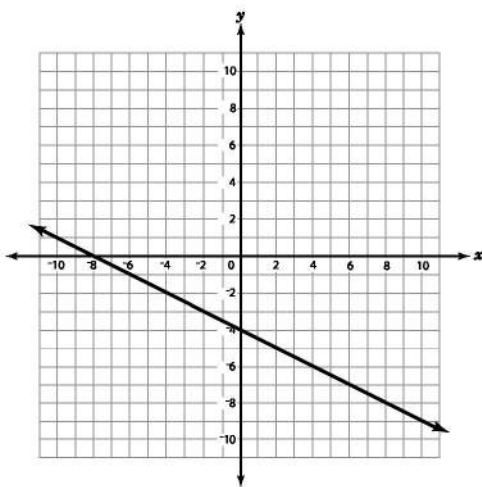
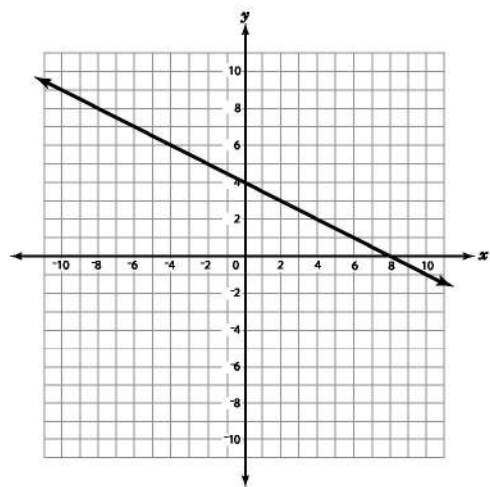
J -8

Content: Mathematics
Item Number: 68
Item ID: 01173264
Item Type: Multiple Choice

Answer Key: G
Max. score points: 1
Standard: 8.PRA.5
Reporting Category: Patterns, Relations & Algebra



Which is the graph of $y = \frac{1}{2}x - 4$?

**F****H****G****J**

Content: Mathematics
Item Number: 52
Item ID: 01173168
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.PRA.7
Reporting Category: Patterns, Relations & Algebra



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Which expression is equal to $-s(-2s + 7)$?

- A** $2s^2 + 7s$
- B** $2s^2 - 7s$
- C** $-2s^2 + 7s$
- D** $-2s^2 - 7s$

Content: Mathematics
Item Number: 65
Item ID: 01008327
Item Type: Multiple Choice

Answer Key: B
Max. score points: 1
Standard: 8.PRA.7
Reporting Category: Patterns, Relations & Algebra



Simplify the expression below.

$$(-9)(5 - 2x)$$

F $45 + 18x$

G $45 - 18x$

H $-45 - 18x$

J $-45 + 18x$

Content: Mathematics
Item Number: 34
Item ID: 01173280
Item Type: Multiple Choice

Answer Key: J
Max. score points: 1
Standard: 8.PRA.7
Reporting Category: Patterns, Relations & Algebra



The table below shows a list of x and y values.

x	y
-3	-5
-2	-2
-1	1
0	4
1	7
2	10

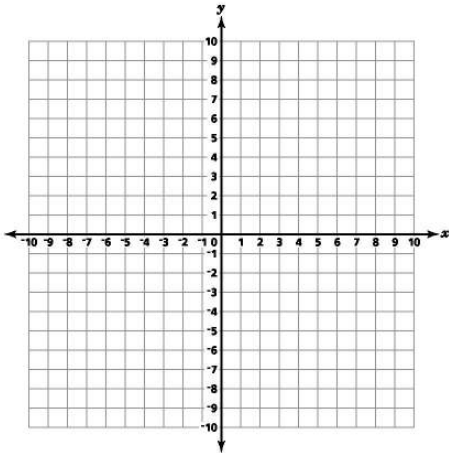
- A** On the coordinate grid in the answer booklet, draw a graph to represent the line containing the list of points shown in the table.
- B** On the coordinate grid in the answer booklet, draw a graph that represents the equation $y = 5x + 2$.
- C** How can you conclude from both graphs that the two functions graphed are linear? Write your answer on the lines in the answer booklet.

Content: Mathematics
Item Number: 32
Item ID: 01173254
Item Type: Constructed Response

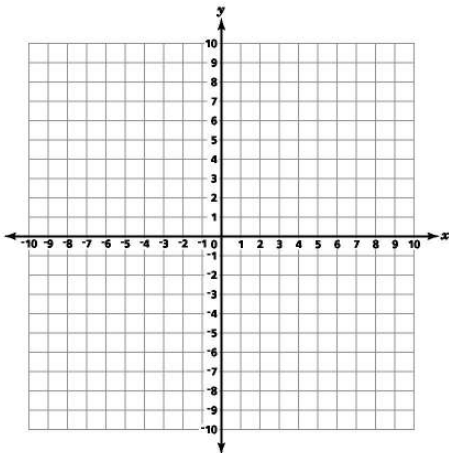
Answer Key:
Max. score points: 3
Standard: 8.PRA.9
Reporting Category: Patterns, Relations & Algebra



A



B



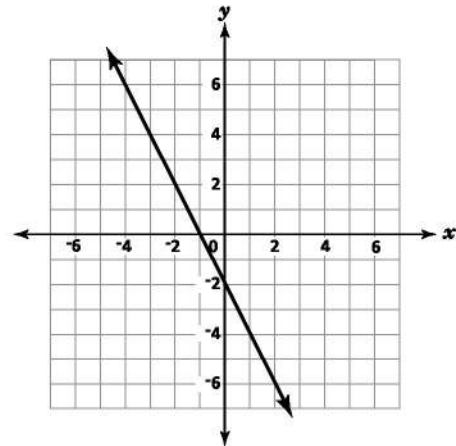
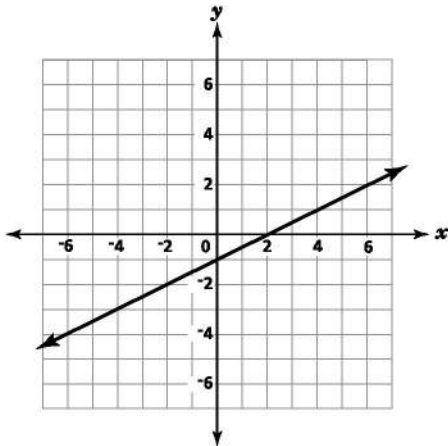
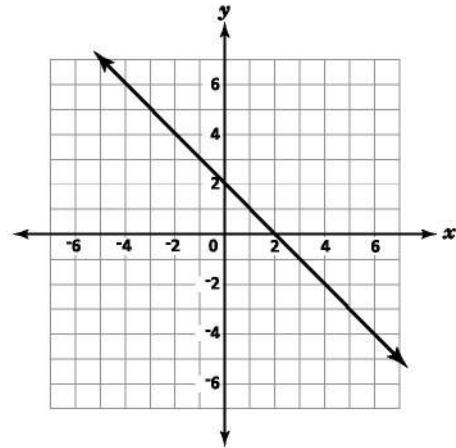
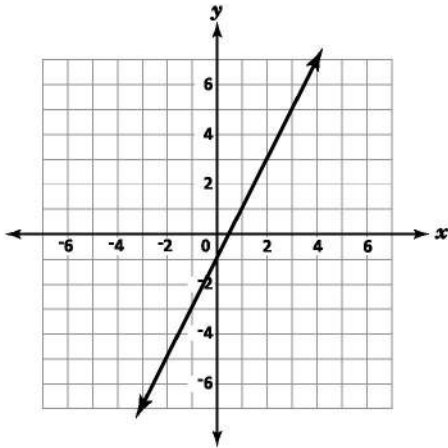
C _____

Content: Mathematics
 Item Number: 32
 Item ID: 01173254
 Item Type: Constructed Response

Answer Key:
 Max. score points: 3
 Standard: 8.PRA.9
 Reporting Category: Patterns, Relations & Algebra



Which shows the graph of $y = 2x - 1$?



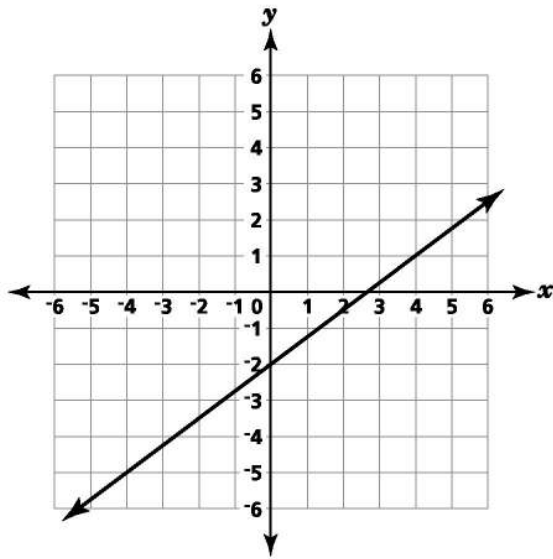
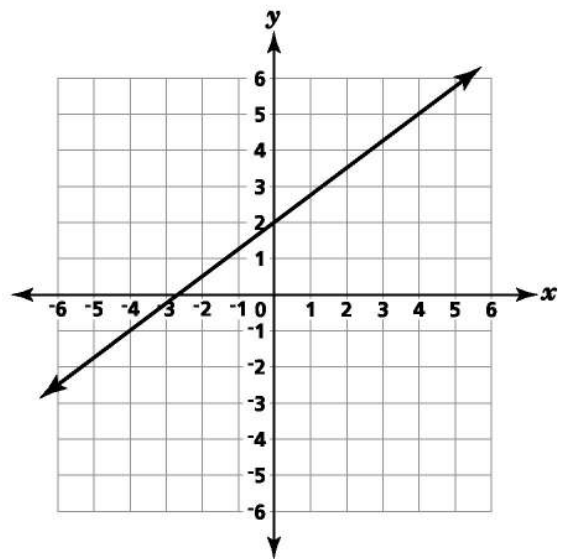
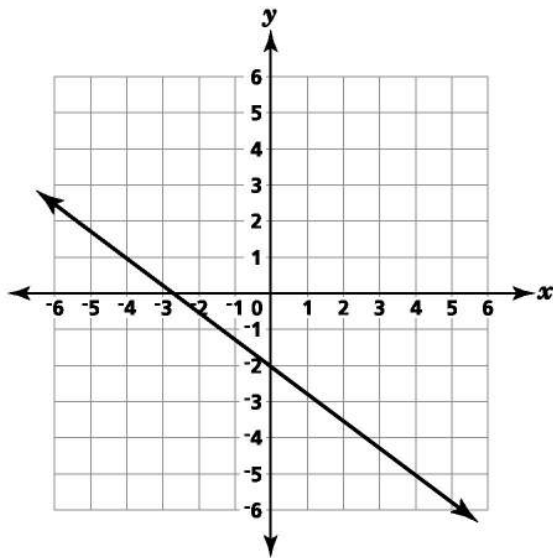
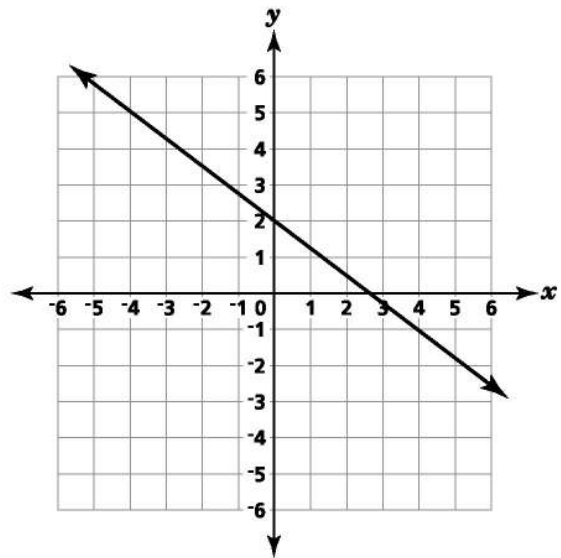
Content: Mathematics
Item Number: 50
Item ID: 01008355
Item Type: Multiple Choice

Answer Key: F
Max. score points: 1
Standard: 8.PRA.9
Reporting Category: Patterns, Relations & Algebra



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Which graph represents the equation $y = \frac{3}{4}x + 2$?

**F****H****G****J**

Content: Mathematics
Item Number: 62
Item ID: 00881920
Item Type: Multiple Choice

Answer Key: H
Max. score points: 1
Standard: 8.PRA.9
Reporting Category: Patterns, Relations & Algebra



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